Claims

- [c1] A method of preparing a multiple chip module (MCM) hat for removal from the MCM, the hat including a base and a piston thermally coupled to a chip and joined to the base by a piston joint, the method comprising the steps of: applying a force to the piston in a direction away from the chip; and heating to reflow the piston joint such that the piston retracts from the chip.
- [c2] The method of claim 1, further comprising the step of removing the hat from the MCM by applying a shearing force.
- [c3] The method of claim 2, wherein the removing step includes removing an epoxy material used to bond the hat to a substrate of the MCM.
- [c4] The method of claim 1, wherein the heating step includes maintaining a temperature that will reflow the piston joint, but not a solder bump used to mount the chip.
- [c5] The method of claim 4, wherein a difference between a melting point of the piston joint and the solder bump is at least 60°C.
- [c6] The method of claim 1, wherein the applying force includes applying one of a spring force and a weight force to the piston.

- [c7] The method of claim 1, wherein the heating step includes heating the piston joint.
- [c8] The method of claim 1, further comprising the step of setting a piston retraction distance.
- [c9] An apparatus for preparing a multiple chip module (MCM) for hat removal where the hat includes a piston thermally coupled to a chip, the apparatus comprising:

 a heater positioned to reflow a joint between the piston and a base of the hat; and
 a retractor for biasing the piston away from the corresponding chip.
- [c10] The apparatus of claim 9, wherein the heater includes a heating element of a substantially same shape as the joint.
- [c11] The apparatus of claim 9, wherein the heater is coupled to the piston.
- [c12] The apparatus of claim 9, wherein the joint includes a solder.
- [c13] The apparatus of claim 9, wherein the piston is substantially cylindrical, and the joint includes an annulus about the piston.
- [c14] The apparatus of claim 9, wherein the retractor includes one of: a spring biasing device coupled to the piston, and a weight coupled to the piston.
- [c15] The apparatus of claim 9, wherein the retractor includes a

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piston travel stop to set a retraction distance of the piston.

- [c16] The apparatus of claim 9, further comprising a support for the base of the hat.
- [c17] The apparatus of claim 9, wherein the hat includes a plurality of pistons, the apparatus further comprising a heater positioned to reflow the joint between each piston and a base of the hat; and a retractor for each piston.
- [c18] The apparatus of claim 9, wherein the heating element maintains a temperature that will reflow the joint, but not a solder bump used to mount the chip.
- [c19] The apparatus of claim 9, wherein a difference between a melting point of the joint and the solder bump is at least 60° C.
- [c20] An apparatus for preparing a multiple chip module (MCM) for hat removal, the hat including a base and a piston thermally coupled to a chip and joined to the base by a piston joint, the apparatus comprising:

 means for biasing the piston away from the chip; and means for heating the piston joint to allow the piston to move away from the chip.

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